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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TRAN, CON P

ART UNIT PAPER NUMBER

2644

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/577,649

Applicant(s)

TREURNIET ET AL.

Examiner

Con P. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. **Claims 1-3, 5, 7, 9-11, 13-14** are rejected under 35 U.S.C. 102(a) as being anticipated by Colomes et al. ("A Perceptual Model Applied to Audio Bit-Rate Reduction", J. Audio Eng. Soc. Vol. 43, pp233-240, April 1995, cited by Applicants (hereinafter, "Colomes").

Regarding **claim 9**, Colomes teaches a system for determining an objective audio quality measurement of a target audio signal, comprising:

a peripheral ear processor (artificial ear) for processing a reference audio signal (i.e., minimum masking curve level) and a target audio signal (i.e., maximum audio signal level) to provide a reference basilar sensation signal and a target basilar sensation signal, respectively (page 238, left column, pars. 3-5; page 234, left column, pars. 2, 3, right column, par. 2);

a comparator for comparing the reference basilar sensation signal and the target basilar sensation signal to determine a basilar degradation signal (calculate the difference; page 238, left column, pars. 5,6); and

a cognitive processor for processing the basilar degradation signal to determine at least one cognitive model component for providing an objective perceptual quality rating (using spreading function, page 235, left column, last paragraph - page 235, right column, second paragraph; page 234, left column, pars 4,5).

Regarding **claim 10**, Colomes teaches a system according to claim 9, wherein the at least one cognitive model component is selected from coefficient of variation of distortion (i.e. upper slope; page 235, left column, last paragraph - page 235, right column, second paragraph).

Regarding **claim 11**, Colomes teaches a system according to claim 9, wherein the peripheral ear processor further provides a harmonic structure from an error spectrum obtained through a comparison of the reference and target audio signals (applying power density spectrum; page 236, left column, last paragraph – page 237, left column, par. 2).

Regarding **claim 13**, Colomes teaches a system according to claim 9, wherein the cognitive processor includes pre-processing means for determining effects of at least one of perceptual inertia, perceptual asymmetry (page 237, left column, second

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paragraph) and adaptive threshold (i.e., below a threshold σ , there will be no detection (page 236, left column, first paragraph).

Regarding **claim 14**, Colomes teaches a system according to claim 9, wherein the peripheral ear processor includes a recursive filter (low pass filter in [8], i.e., autoregressive filter in Paillard et al., page 24, right column, prior art in record; see Colomes page 234, right column, paragraph 2).

Regarding claims **1, 2, 3, 7, and 5**, these claims merely reflect the process to the apparatus claim of claims 9, 10, 11, 13, and 14, respectively and are therefore rejected for the same reasons.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 4, 6, 12 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Colomes et al. ("A Perceptual Model Applied to Audio Bit-Rate Reduction", J. Audio Eng. Soc. Vol. 43, pp233-240, April 1995, cited by Applicants (hereinafter, "Colomes") in view of Hollier U.S. Patent 5,621,854.

Regarding **claim 12**, Colomes teaches a system according to claim 9. However, Colomes does not explicitly disclose wherein the cognitive processor includes a multi-layer neural network.

Hollier teaches method and apparatus for objective speech quality measurement (Title) in which an analysis unit (8, Fig. 2) having outputs being combined by processing of a neural network (col. 11, line 59 – col. 12, line 12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a neural network of Hollier with Colomes artificial ear model for purpose of providing a signal indicating the perceptual significance of the distortion in the signal, as suggested by Hollier in column 12, lines 8-9).

Regarding **claim 15**, Hollier further teaches a system according to claim 9, wherein the cognitive processor includes weighting means for adjacent frequency ranges (col. 9, lines 5-31; Fig. 9).

Regarding claims **4 and 6**, these claims merely reflect the process to the apparatus claim of claims 12 and 15 and are therefore rejected for the same reasons.

5. **Claims 8 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Colomes et al. ("A Perceptual Model Applied to Audio Bit-Rate Reduction", J. Audio Eng. Soc. Vol. 43, pp233-240, April 1995, cited by Applicants (hereinafter,

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"Colomes") in view of International Telecommunication Union- Radiocommunication Sector BS 1387-1 (1998-2001) (hereinafter, "ITU-R BS 1387-1").

Regarding **claim 16**, Colomes teaches a system according to claim 9. However, Colomes does not explicitly disclose wherein the cognitive processor includes adjustment means for adjusting the basilar degradation signal according to a variance of auditory filter envelope modulation rates of the reference audio signal.

ITU-R BS 1387-1 teaches an objective measurement of perceived audio quality in which a cognitive processor includes adjustment means for adjusting the basilar degradation signal according to a variance of auditory filter envelope modulation rates of the reference audio signal (Table 4, page 16; page 19, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated an objective measurement of perceived audio quality of ITU-R BS 1387-1 with a perceptual model of Colomes for purpose of providing an accurate model of a peripheral auditory system as well as cognitive aspects of audio quality judgment, as suggested by ITU-R BS 1387-1 in page 17, last paragraph. It should be noted that ITU-R BS 1387-1 start date is 1998.

Regarding claim 8, this claim merely reflects the process to the apparatus claim of claim 16 and is therefore rejected for the same reason.

Response to Arguments

6. Applicants' arguments filed April 4, 2005 regarding claims 1-16 have been fully considered but they are not persuasive.

7. Applicants assert on pages 3-5, regarding claim 9:

"The cited section of page 238 of Colomes et al. describes two different technique to calculate the signal-to-mask ratio. . . .actual level of the input signal . . . is the level of the input containing distortion . . . basilar degradation signals."

Examiner respectfully disagrees. There is also sections in page 234, left column, pars. 2, 3, right column, par. 2 being cited regarding artificial ear. In addition, a reference audio signal and a target audio signal are not limited to "actual" signal and "input signal containing distortion", which are also not in the claim.

8. Applicants further assert on pages 5-6, regarding claim 9:

"However, the (cochlca) spreading function of Colomes et al. is merely one element. . . Moreover, Applicants submit that Colomes et al. does not disclose, teach or suggest a cognitive processor per se, and only describes one particular implementation of a peripheral ear model. . . . merely present a propose model, with no validation by testing with human subjects. . . object quality measure system."

Examiner respectfully disagrees. Colomes et al. using spreading function for excitation then using noise threshold to detect different of excitation for basilar degradation evaluation. Although there is no validation, but Colomes et al. teaches the claimed limitations.

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9.. Applicants further assert on page 6, regarding claims 8 and 16:

“It is clear that both the recommendation for corrections and the 1387- 1 revised document were published after the filling of the present application.”

Examiner respectfully disagrees. As indicated in the Office Action, Examiner maintain that ITU-R BS 1387-1 (1998-2001) contains subject matter supporting rejections of claims 8 and 16, i.e., 1998.

10. With respect to rejections of **claims 1-7, and 9-15**, subject matters in claims 1-7, and 9-15 are supported by parent application PCT/CA99/00258. Therefore priority of parent application PCT/CA99/00258 is sufficient to overcome the ITU-R BS 1387-1 (1998-2001) reference. Accordingly, rejections of claims 1-7, and 9-15 are withdrawn.

With respect to rejections of **claims 8 and 16**, subject matters in claims 8 and 16 are not supported by parent application PCT/CA99/00258. Therefore claims 8 and 16 cannot obtain the benefit of the filing date of parent application PCT/CA99/00258. Thus, priority of parent application PCT/CA99/00258 is not sufficient to overcome the ITU-R BS 1387-1 reference (1998-2001).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Con P. Tran whose telephone number is (571) 272-7532. The examiner can normally be reached on M - F (8:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Vivian C. Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306; and 571-273-8300 effective July 15, 2005.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should


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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cpt CPJ
July 11, 2005



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